

from the first to the last without annealing; and you can imagine by the time it reaches that small wire how very hard it is. It takes the place of steel piano wire, which I never think of using, because even if plated with gold after being plated with copper, in a little while it will flake off and become black. If you make this German silver wire properly you will find in it all the elasticity you desire. (Samples of rotating wire distributed.)

Now, we come to the tubing. The tubing is cut into strips. One end of the tube is tapered, and then with a long pair of plyers those ends are curved so that they lock into each other. After cutting the tube say eight or ten inches long they should be thoroughly annealed. The draw plates should be oiled in this process as well as in drawing down the wire, and they should be started in larger holes first. The first thing is to curve the piece so that it will more readily pass into the draw plate, and that can be done by having a little groove cut into some hard wood or piece of iron and laying this strip down over the groove, and laying on that a piece of iron wire and strike it with a hammer until it is driven down into that groove; that gives it the curve and will enable you more readily to start it into the draw plate. There is a draw plate made now that was made under my direction for the first time four or five years ago, with three holes in it at one end, known as the Case draw plate—S. S. White, of Chicago, handles it. If you did not use this you would have two draw plates, one for the starting of the tubing and possibly the larger wire, and then for carrying down the smaller. Starting at the smaller ones you readily run down to the size that is necessary for the usual draw plates, and then from that on down. The width is not so material in the cutting, because if you cut the tube a little too wide at first and it comes together early in the work, when you intend to make quite small tubing you should continue to pull that right down just the same as cutting, and I sometimes think you get a great deal better quality of tubing in that way, although it is not so necessary to have the tubing as hard as the wire.

Now in regard to making nuts, cutting the thread, etc. The first thing is to have a proper screw plate, and the best one I know is the Martin that has a slit upon one side—not the ordinary old-fashioned Martin. That enables the screw plate to cut the thread rather than pinching it down in, and often times breaking, the wire. For taps we order wire that is the exact size of the engine bur wire, and we have it turned similar to these different sizes for the different taps that are necessary. This is turned down for a thread that can be threaded, upon which the nut can be screwed till it is finally finished. The nut, then being screwed upon that after making it—finished by filing down to the diameter of the tap—